

WHAT IS CLAIMED IS:

1. A communication semiconductor integrated circuit device, comprising:

a transmitting oscillator including at least constituent elements excluding inductance elements, which are formed over a semiconductor chip;

a first external terminal which outputs a signal generated by the transmitting oscillator therethrough;

a phase detection circuit which compares the phase of a reference signal and the phase of a feedback signal and thereby controls the transmitting oscillator in accordance with the phase difference;

a second external terminal which receives a signal supplied from outside; and

a signal combinational circuit which combines the signal inputted to the second external terminal and a signal having a predetermined frequency,

wherein the signal combinational circuit comprises a differential circuit including a pair of differential input terminals, attenuation means that attenuates the signal inputted to the second external terminal and transmits the attenuated signal is provided between one differential input terminal of the signal combinational circuit and the second external terminal, and the other differential input terminal

of the signal combinational circuit is connected to a third external terminal via elements identical to elements that constitute the attenuation means.

2. A communication semiconductor integrated circuit device according to claim 1, wherein the third external terminal is a terminal to which a significant signal is inputted from outside and set so as not to output a significant signal from inside.

3. A communication semiconductor integrated circuit device according to claim 1, wherein a signal inputted to the second external terminal and generated by combination with the signal having the predetermined frequency by the signal combinational circuit is capable of being supplied to the phase detection circuit as the feedback signal.

4. A communication semiconductor integrated circuit device according to claim 1, further comprising:

an amplitude detection circuit which compares the amplitude of a signal inputted to the second external terminal and generated by combination with the signal having the predetermined frequency by the signal combinational circuit and the amplitude of the reference signal and generates a signal corresponding to the difference in amplitude, and a fourth

external terminal which outputs a voltage corresponding to the output of the amplitude detection circuit therethrough.

5. A communication semiconductor integrated circuit device according to claim 1, wherein the signal combinational circuit comprises a Gilbert cell comprising bipolar transistors, the signal inputted to the second external terminal is inputted to an emitter terminal of one of the lower differential input transistors of the Gilbert cell, and the third external terminal is connected to an emitter terminal of the other of the lower differential input transistors of the Gilbert cell via the elements identical to the elements constituting the attenuation means.

6. A communication semiconductor integrated circuit device according to claim 1, wherein the signal combinational circuit is a mixer which generates a signal of a frequency equivalent to the difference between the frequency of the signal inputted to the second external terminal and the frequency of the signal having the predetermined frequency.

7. A communication semiconductor integrated circuit device according to claim 1, further comprising:

an oscillator which generates the signal having the predetermined frequency; and

a second mixer which combines the signal generated by the oscillator and the signal generated by the transmitting oscillator and generates a signal having a frequency component equivalent to the difference in frequency therebetween,

wherein the output signal of the second mixer is supplied to the phase detection circuit.

8. A communication semiconductor integrated circuit device according to claim 7, further comprising switching means which selects any of the output signal of the second mixer and the signal inputted to the second external terminal and generated by combination with the signal having the predetermined frequency by the signal combinational circuit and supplies the same to the phase detection circuit.

9. A wireless communication system, comprising:

a communication semiconductor integrated circuit device, said communication semiconductor integrated circuit device including:

a transmitting oscillator including at least constituent elements excluding inductance elements, which are formed over a semiconductor chip;

a first external terminal which outputs a signal generated by the transmitting oscillator therethrough;

a phase detection circuit which compares the phase

of a reference signal and the phase of a feedback signal and thereby controls the transmitting oscillator in accordance with the phase difference;

a second external terminal which receives a signal supplied from outside;

a signal combinational circuit which combines the signal inputted to the second external terminal and a signal having a predetermined frequency;

an amplitude detection circuit which compares amplitude between the signal combined by the signal combinational circuit and the reference signal and feedback signal and detects the difference in amplitude;

voltage generating means which generates a voltage corresponding to the detected amplitude difference; and

a third external terminal which outputs the generated voltage therethrough;

a power amplifier which amplifies the signal outputted through the first external terminal with gain corresponding to the voltage outputted through the third external terminal and outputs the same;

output detecting means which detects the output of the power amplifier; and

attenuation means which attenuates the signal detected by the output detecting means and inputs the same to the second external terminal,

wherein the attenuation means sets the amount of attenuation of the detected signal in such a manner that when the power amplifier is operating at the minimum output level, the level of the detected signal inputted to the second external terminal becomes greater than the level of noise jumped from the first external terminal to the second external terminal.

10. A wireless communication system according to claim 8, wherein the signal combinational circuit comprises a differential circuit including a pair of differential input terminals, attenuation means that attenuates the signal inputted to the second external terminal and transmits the same is provided between one differential input terminal of the signal combinational circuit and the second external terminal, and the other differential input terminal of the signal combinational circuit is connected to a fourth external terminal via elements identical to elements that constitute the attenuation means, and

wherein a resistive element is provided between the fourth external terminal and an external constant voltage terminal of the communication semiconductor integrated circuit device.

11. A wireless communication system according to claim 8, further comprising a baseband circuit which generates an I/Q

signal corresponding to transmit data and outputs the same,  
wherein the communication semiconductor integrated circuit device includes a modulator which performs quadrature modulation in accordance with the I/Q signal supplied from the baseband circuit, and supplies the signal modulated by the modulator to the phase detection circuit and the amplitude detection circuit as the reference signal.

12. A communication semiconductor integrated circuit device, comprising:

a transmitting oscillator including at least constituent elements excluding inductance elements, which are formed over a semiconductor chip;

a first external terminal which outputs a signal generated by the transmitting oscillator therethrough;

a phase detection circuit which compares the phase of a reference signal and the phase of a feedback signal and thereby controls the transmitting oscillator in accordance with the phase difference;

a second external terminal which receives a signal supplied from outside; and

a signal combinational circuit which combines the signal inputted to the second external terminal and a signal having a predetermined frequency,

wherein the signal combinational circuit includes a

differential circuit including a pair of differential input terminals, first attenuation means is provided between one differential input terminal of the signal combinational circuit and the second external terminal, and second attenuation means is provided between the other differential input terminal of the signal combinational circuit and a third external terminal supplied with a predetermined potential.